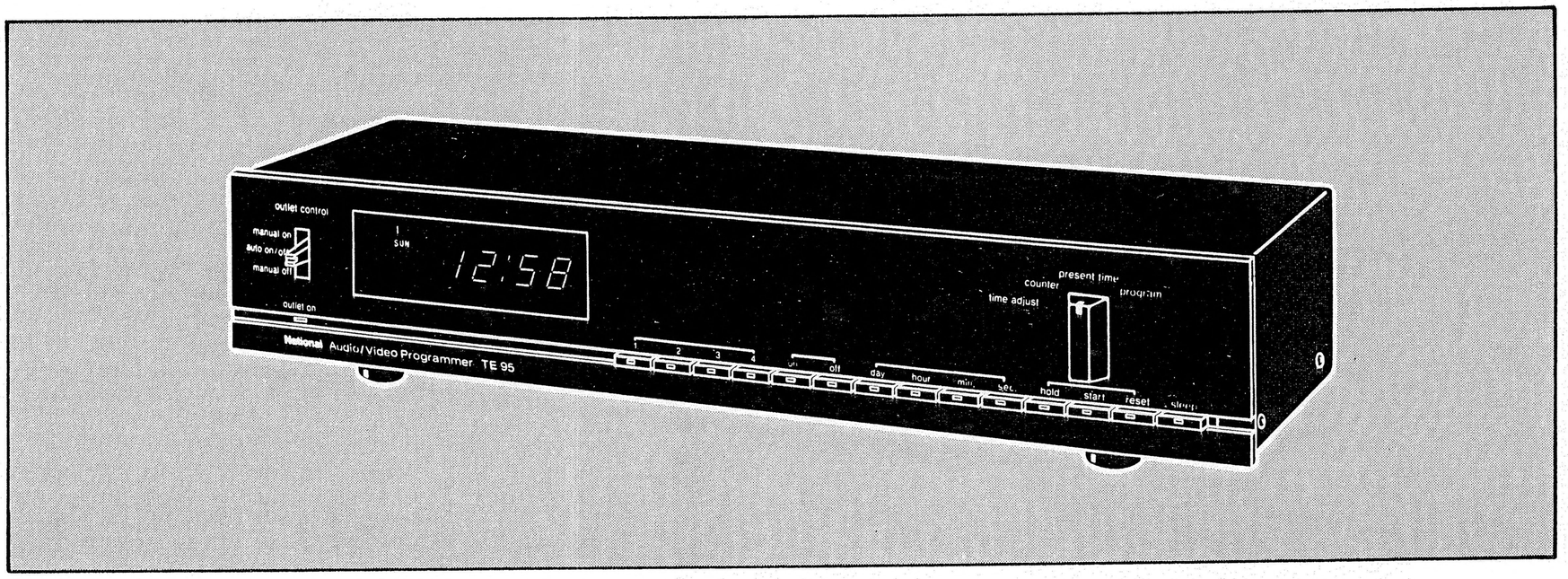
Operating Instructions

Audio / Video Programmer

TE 95



National

Before operating this set, please read these instruction completely.

SPECIFICATIONS

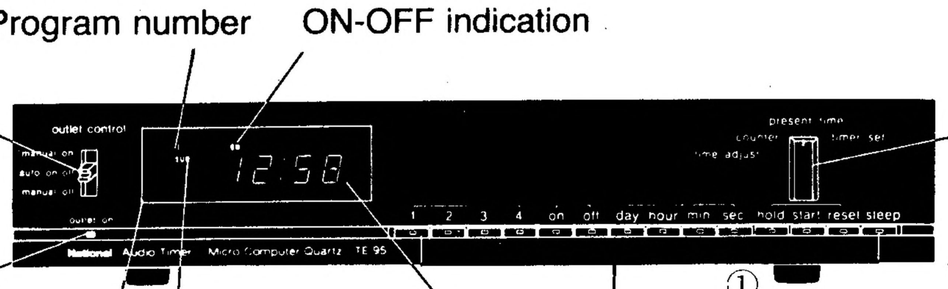
Power source:	110 V AC, 220 V AC, (separately available)
Power consumption:	8 W for operation of programmer
Power capacity:	600 W (110 V AC), 1100 W (220 V AC)
Switch construction:	Double pole-single throw
Clock accuracy:	Within 10 seconds per month (quartz oscillator incorporated)
Timer accuracy:	+0.02 second against preset program
Dimensions:	74×360×130 mm
Weight:	2,200 g

COMPONENT FUNCTIONS

OUTLET CONTROL
This switch is for selecting the power control function for the outlet receptacle.

A) Manual ON and Manual OFF
   Load starts or stops operation accordingly regardless of the program.
B) Auto ON/OFF
   Load operates according to the program.

OUTLET INDICATOR
When power is supplied to the outlet receptacle, the lamp illuminates.



MODE SELECTOR
There are four positions for the programmer. Memory is provided for the various functions. At the same time, the change of mode will permit readout for each function.

DIGITAL TIME DISPLAY
The digital time display acts in conjunction with the mode to display the time and symbol of the selected function.

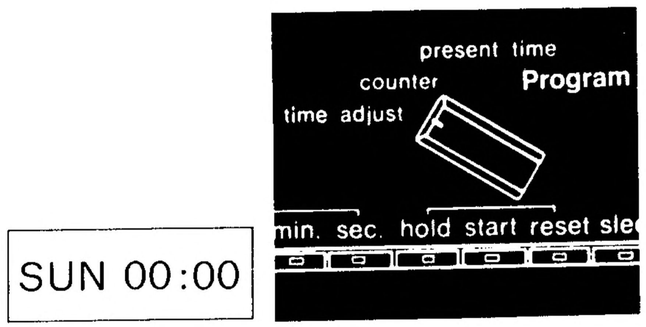
ENGLISH VERSION

OPERATION

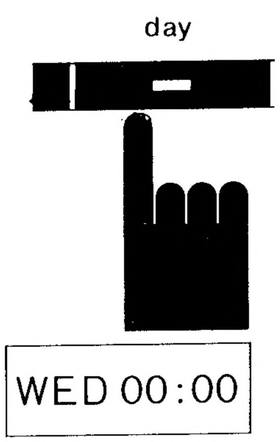
Time adjustment (Ex.; present time is 14:30 Wednesday)

(1) Power on
When electrical power is supplied to the timer for the first time or when there is a power suspension, the figure 0:00 and the symbol "SUN" always appear and flash. Once the reference time is selected, the flashing stops.

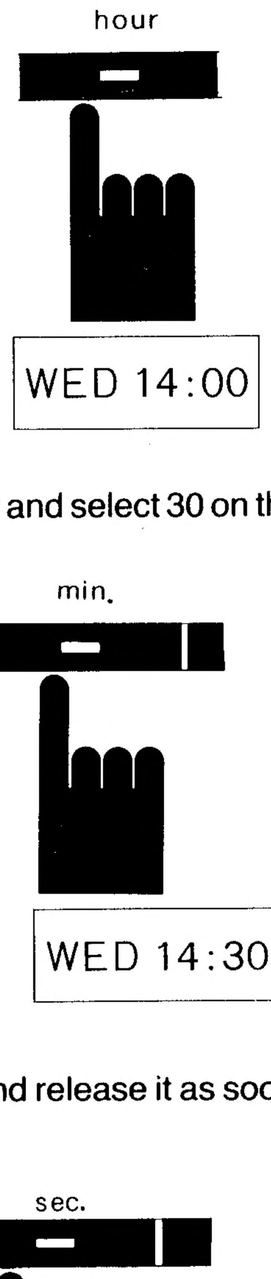
(2) Mode selector→"TIME ADJUST"



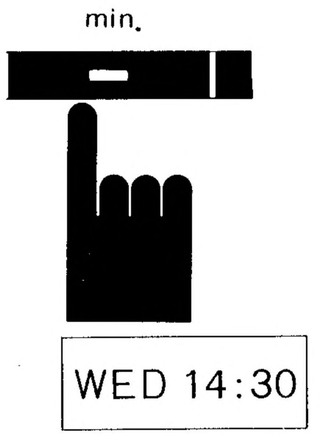
(3) Operate the key "day" and select "WED" on the display.



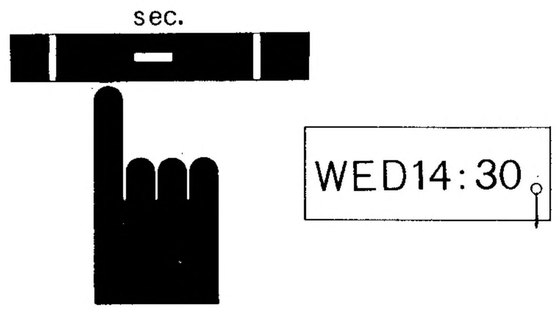
(4) Operate the "hour" key and select 14 on the left half of the display.



(5) Operate the "min." key and select 30 on the right half of the display.



(6) Push the key "sec." and release it as soon as reliable time signal is heard.



ENGLISH VERSION

(7) Mode selector→"PRESENT TIME"
The present time position can prevent the time keeping mechanism from being disturbed by an accidental operation of various keys. It can also read out exact second by pushing the "sec." key.

Program

Ex.; present time is 14:30 Wednesday

Desired programs are; turn on the load 12:00 Friday
turn it off 12:45 Friday — program 1

turn on the load 16:00 Friday
turn it off 18:00 Friday — program 2

turn on the load at every day
of the week from 8:00 to 9:00 — program 3

turn on the load 23:00 Friday
turn it off 03:00 Saturday — program 4

Program 1

As a preliminary condition for operating the programmer, set the present time first.

(1) Mode selector→"PROGRAM"
(2) Push the program code key 1.
(3) Push the "on" key.
(4) Operate the "day" key until the symbol "FRI" appears.
(5) Operate the "hour" and "min." keys and set 12:00.
(6) Push the "off" key.
(7) Operate the "hour" and "min." keys, and set 12:45.

Program 2

(8) Program code key 2.
(9) Push the "on" key.
(10) Operate the "day", "hour" and "min." keys and set 16:00 Friday.
(11) Push the "off" key.
(12) Operate the "hour" and "min." keys, and set 18:00 .

Program 3

(13) Push the program code key 3.
(14) "on" key
(15) Operate the "day" key until all the day symbols are illuminated.
(16) Operate the "hour" and "min." keys, and set 8:00.
(17) Push the "off" key.
(18) Operate the "hour" and "min." keys, and set 9:00.

Program 4

In the case of program 4, repeat the procedures 2–7 and select the adequate figures and symbol.

NOTE: The "day" key cannot be operated when the off time is carried over to a different day of the week. However, within 24 hours, the off time can be set after on time setting is over without changing the day of the week.

(19) When all the programs are memorized, turn the Mode selector to the present time position.
(20) Set the outlet control switch to the "AUTO ON/OFF" position.
(21) Connect the plug of an equipment which you want to control by the timer, to the AC outlet of the timer. Please note to turn the switch of the equipment on.
(22) The memorized program codes on the display will be illuminated when the Mode selector is finally set to the present time position and the code will flash when the time comes and the load starts operation.

ENGLISH VERSION

Call back of the memorized program

(1) Mode selector→"PRESENT TIME"
(2) Push the program code key. Then the programmed times appear and within a few seconds present time again appears.

Cancellation of the memorized program

(1) Mode selector→"PROGRAM"
(2) Push the program code key.
(3) Mode selector→"PRESENT TIME"

Second indication

(1) Mode selector→"PRESENT TIME"
(2) Push the "sec." key.

Time counting (Time unit is max. of 99 minutes 59 seconds)

(1) Mode selector→"COUNTER"
(2) Operate the "start" key.
(3) To clear the time, push the "reset" key.
(4) To stop counting for a temporary period, operate the key "hold".

Sleep timer (Time unit is max. of 99 minutes)

(1) Mode selector→"COUNTER"
(2) Push the "reset" key.
(3) Mode selector→"PRESENT TIME"
(4) Push the key "sleep" and set the desired length of time.

SPECIAL NOTES

National Audio/Video Programmer is exclusively designed for use with audio equipment or videotape recorder.

The programmer may be used for loads up to 1100 W (220 V AC), or 600 W (110 V AC). Do not use for any devices which require more than 1100 W or 600 W.

Avoid using in a location where the temperature exceeds 45°C or less than −5°C, where there is severe vibration, excessive humidity or excess dust, near continuous arcing equipment such as a pump, fan or large type mixer.

This programmer is an AC power source programmer and may become warm in use. This will not impair its function nor in any way reduce the life of the programmer.

If the surface of the programmer becomes soiled, use a cloth dampened with soapy water for cleaning after making sure that the electric power source is cut. Do not use chemical solvents of any type for cleaning.

For PX customer only

The following specifications are exclusive for PX version programmer.

1. The three-way voltage selector (120/220/240 V AC) is included. Please check the voltage selector located at the upper right of the rear cover before operation and adjust the selector to the adequate voltage using coin or screw driver.
2. Convenient plug adaptor set is included. Use the adaptor set for the purpose of changing the originally equipped continental plug and outlet receptacle for the American types, when the programmer is used in the U.S.A. and Canada.

For U.K. customer only

The following specifications and cautions are exclusive for U.K. version Audio/Video Programmer.

1. Power source is 240 V
2. Though two outlet receptacles are provided in the programmer, total combined power capacity must not exceed 1,100 W.

3. Information on connecting auxiliary units.
   Both grounded or non-grounded equipment may be operated from AC outlet sockets of this programmer. Grounded equipment will have three wire supply cable. Non-grounded equipment will have only 2 wires. The plugs are provided for connecting units to the outlet sockets. When connecting these plugs, the following instructions must be observed.
   1) Remove nylon screw from underside of plug.
   2) Insert supply cable into plug body and fit the cable clamp so that its grips the outer sheaf of the cable.
   3) Connect the wire which is coloured BLUE to the pin marked N.
   4) Connect the wire which is coloured BROWN to the pin marked L.
   5) If the supply cable has a third wire coloured green/yellow, this must be connected to the pin marked E.

WARNING: THIS PROGRAMMER UNIT MUST ALWAYS BE GROUNDED.
If in doubt, consult a competent electrician.

NAEHERE ANGABEN

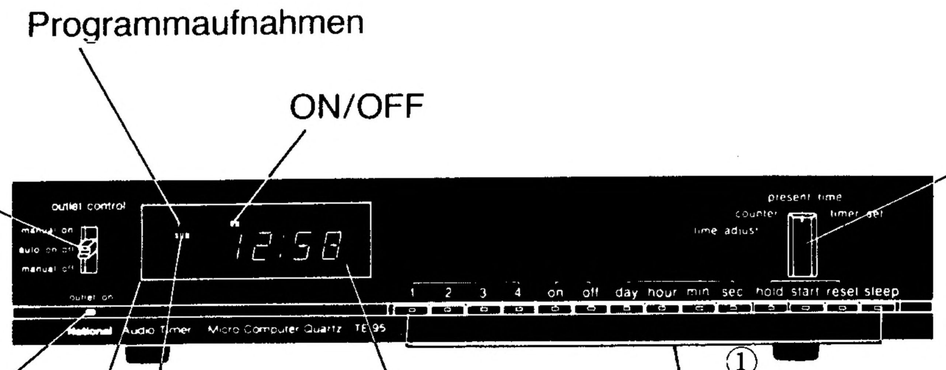
Netzanschluss:	220 V∼, 50 Hz
Stromverbrauch:	8 W für den Programmierer
Stromstärke:	1100 W (220 V∼)
Schaltung:	Doppelpol-Einrichtschaltung
Uhrenpräzision:	±10 Sekunden/Monat (eingebauter Quarz Oszillator)
Timerpräzision:	+0,02 Sekunden/eingestellte Zeit
Grösse:	74×360×130 mm
Gewicht:	2.200 g

EINZELFUNKTIONEN

OUTLET CONTROL (Anschluss zu Audio/Video Apparaten)
Er reguliert folgende zwei Funktionen:

A) Manual ON und Manual OFF
   Stromzufuhr unabhängig von den gespeichertén Programmen
B) Auto ON/OFF
   Automatische Stromzufuhr für die

OUTLET INDICATOR (Stromindikator)
Die Lampe leuchtet auf, sobald der Strom angeschlossen ist.



MODE SELECTOR
(Funktionsschalter)
Er hat vier Stellungen, deren verschiedene Funktionen vom Micro Computer gespeichert werden. Beijedem Funktionswechsel erscheinen die entsprechen den Angaben auf der Digitaltafel.

DIGITAL ZEITTAFEL
Mit den verschiedenen Stellungen kombiniert, zeigt sie jeden Funktionswechsel an. Auf ihr erscheinen Programmnummer.

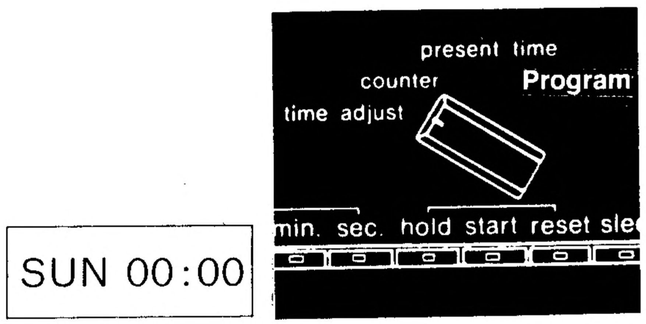
GERMAN VERSION

BEDIENUNG

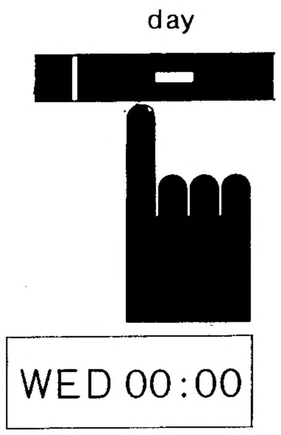
Zeiteinstellung (Ex: Mittwoch 14:30)

(1) Einschalten

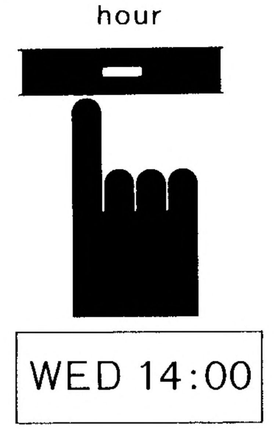
(2) Funktionsschalter→"TIME ADJUST"



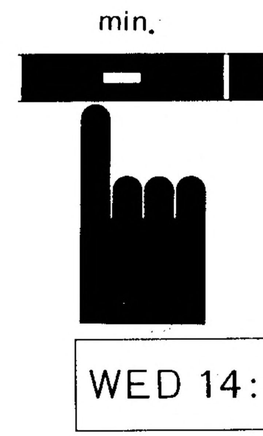
(3) Knopf "DAY"→"WED" (auf Digitaltafel)



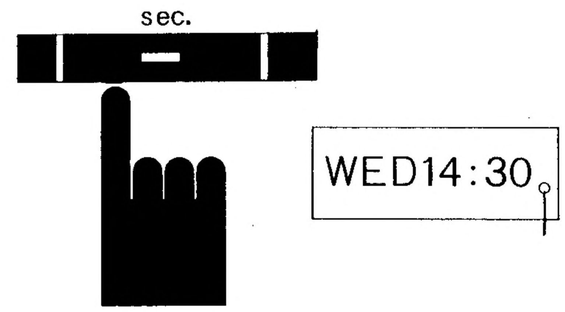
(4) Knopf "HOUR" →14 (auf linker Seite der Digitaltafel)



(5) Knopf "MIN" →30 (auf rechter Seite der Digitaltafel)



(6) Druck auf "SEC." Knopf, bis ein Signal des Radios für 14:30 ertönt, loslassen.



(7) Funktionsschalter→"PRESENT TIME"

GERMAN VERSION

Programme

Diese Zeiteinstellung muss vor jeder Programmspeicherung gemacht werden.

Ex: Auf Mittwoch 14:30

Gewünschte Programme:

Programm 1	.....Freitag 12:00 ON
	Freitag 12:45 OFF
Programm 2	.....Freitag 16:00 ON
	Freitag 18:00 OFF
Programm 3	.....täglich 8:00 ON
	9:00 OFF
Programm 4	.....Freitag 23:00 ON
	Samstag 06:00 OFF

Bedienungsanleitung für die einzelnen Programmbeispiele

Programm 1

(1) Funktionsschalter→"PROGRAM"
(2) "Program code" Knopf 1
(3) "ON" Knopf
(4) Druck auf "DAY" Knopf→FRI (Freitag)
(5) "HOUR" und "MIN" Knöpfe→12:00
(6) "OFF" Knopf
(7) "HOUR" und "MIN" Knöpfe→12:45

Programm 2

(8) "Program code" Knopf 2
(9) "ON" Knopf
(10) Druck auf "DAY" Knopf→FRI
(11) "HOUR" und "MIN" Knöpfe→16:00
(12) "OFF" Knopf
(13) "HOUR" und "MIN" Knöpfe→18:00

Programm 3

(14) "Program code" Knopf 3
(15) "ON"
(16) "DAY" für alle Wochentage
(17) "HOUR" und "MIN" Knöpfe→8:00
(18) "OFF"
(19) "HOUR" und "MIN" Knöpfe→9:00

Programm 4

Wiederholen Sie die Prozedur von 2-7 mit entsprechender Zeiteinstellung

Bemerkung: Eine Aufnahmedauer kann bis 24 Stunden dauern. Reicht sie aber in den nächsten Tag hinein, so kann mit den "DAY" Knopf nur der Anfangstag eingestellt werden. Die programmierte Stundendauer reguliert dann das automatische Ausschalten.

(20) Nach Speicherung aller Programme
Funktionsschalter→"PRESENT TIME"
(21) OUTLET CONTROL→"AUTO ON/OFF"
(22) Schliessen Sie den Programmierer mit dem Verbindungskabel am Apparat an. Schalten Sie den Apparat vor der Aufnahme ein.
(23) Für einen kurzen Moment erscheinen die Programmnummern und -zeiten, wenn der Funktionsschalter auf PRESENT TIME zurückgestellt wird. Während der automatischen Aufnahme blinken die entsprechende Programmnummer und -zeit.

GERMAN VERSION

Rückruf des gespeicherten Programmes

(1) Wahlscheibe→"PRESENT TIME"
(2) "Program code" Knopf
Nun erscheint für kurze Zeit die Programmzeit, (Einschaltzeit/ Ausschaltzeit, bis die laufende Zeit wieder aufleuchtet.

Löschen des gespeicherten Programmes

(1) Funktionsschalter→"PROGRAM"
(2) "Program code" Knopf
(3) Funktionsschalter→"PRESENT TIME"

Sekundenangabe (Ex: Auf Mittwoch 14:30 und 25 Sekunden)

(1) Funktionsschalter→"TIME ADJUST"
(2) Knopf "SEC".

Zeitmessung (Zeiteinheit: Max. 99 Minuten 59 Sekunden)

(1) Funktionsschalter→COUNTER
(2) "START" Knopf, die Sekundenzählung beginnt
(3) "RESET" Knopf, wenn die Zählung von Null aus starten soll
(4) "HOLD" Knopf, wenn die Zeit gestoppt werden soll

Schlaftimer (Zeiteinheit: Max 99 Minuten)

(1) Funktionsschalter→"COUNTER"
(2) "RESET" Knopf
(3) Funktionsschalter→"PRESENT TIME"
(4) "SLEEP" Knopf, Einstellen der gewünschten Zeitdauer (in Minuten)

ZUR BEACHFUNG

Der National Audio/Video Programmierer ist ausschliesslich für den Gebrauch mit einer Hi-Fi Anlage oder einem Videoaufnahmegerät gebaut.
Stromstärke bis zu 1100 W. Vermeiden Sie den Gebrauch mit Apparaten von über 1100 W (220 V~).

Extreme Temparaturen von über 45°C oder unter −5°C, starke Vibration, grosse Feuchtigkeit und dichter Staub, Erschütterungen durch Pumpen, Ventilatoren oder grosses Mixern schaden dem Programmierer.
Dieser Programmierer wird etwas warm im Gebrauch, was aber seine Funktion und Lebensdauer nicht beeinträchtigen wird.

Reinigung: Verwenden Sie einen mit Seifenwasser befeuchteten Lappen. Chemische Reinigungsmittel sollten verhütet werden.
Kontrollieren Sie vor der Reinigung, ob der Stecker ausgezogen ist.

Dieses Gerät ist gemäß VDE 0875 nach Funkstörgrad N entstört. Wird das TE95 mit anderen Geräten, die weitere Störquellen enthalten, in einer Anlage verwendet, hat der Betreiber/Installateur aufgrund der bestehenden Funk-Entstörpflicht (siehe Allgemeine Genehmigung nach dem Gesetz über den Betrieb von Hochfrequenzgeräten vom 26. 2. 1973, Bundesanzeiger Nr. 47 vom 8. 3. 1973) dafür zu sorgen, daß außerhalb der gesamten Anlage der Funkstörgrad N eingehalten wird.

Dies ist in der Regel der Fall, wenn der Programmierer in Verbindung mit weitern Geräten betrieben wird, die ebenfalls den Funkstörgrad N einhalten.

GERMAN VERSION

ORDER NO. MEW/CLD 7809-12

Service Manual

Audio/Video Programmer

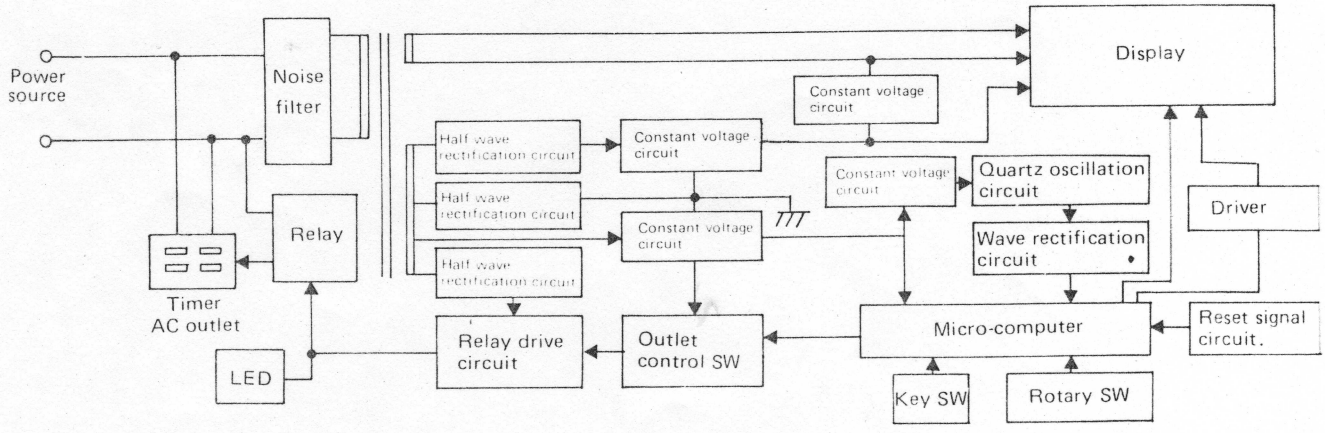
TE-95

Specifications

Power source:	110VAC, 220VAC, 240VAC 50/60 Hz (separately available)
Power consumption:	8W for operation of programmer
Power capacity:	1,100W (220VAC and 240VAC) or 600W (110VAC)
Switch construction:	Double pole-single throw
Clock accuracy:	+10 seconds per month (quartz oscillator incorporated)
Timer accuracy:	+0.02 second against preset program
Dimensions:	74 x 360 x 130 mm
Weight:	2,200g

(Black)

BLOCK DIAGRAM



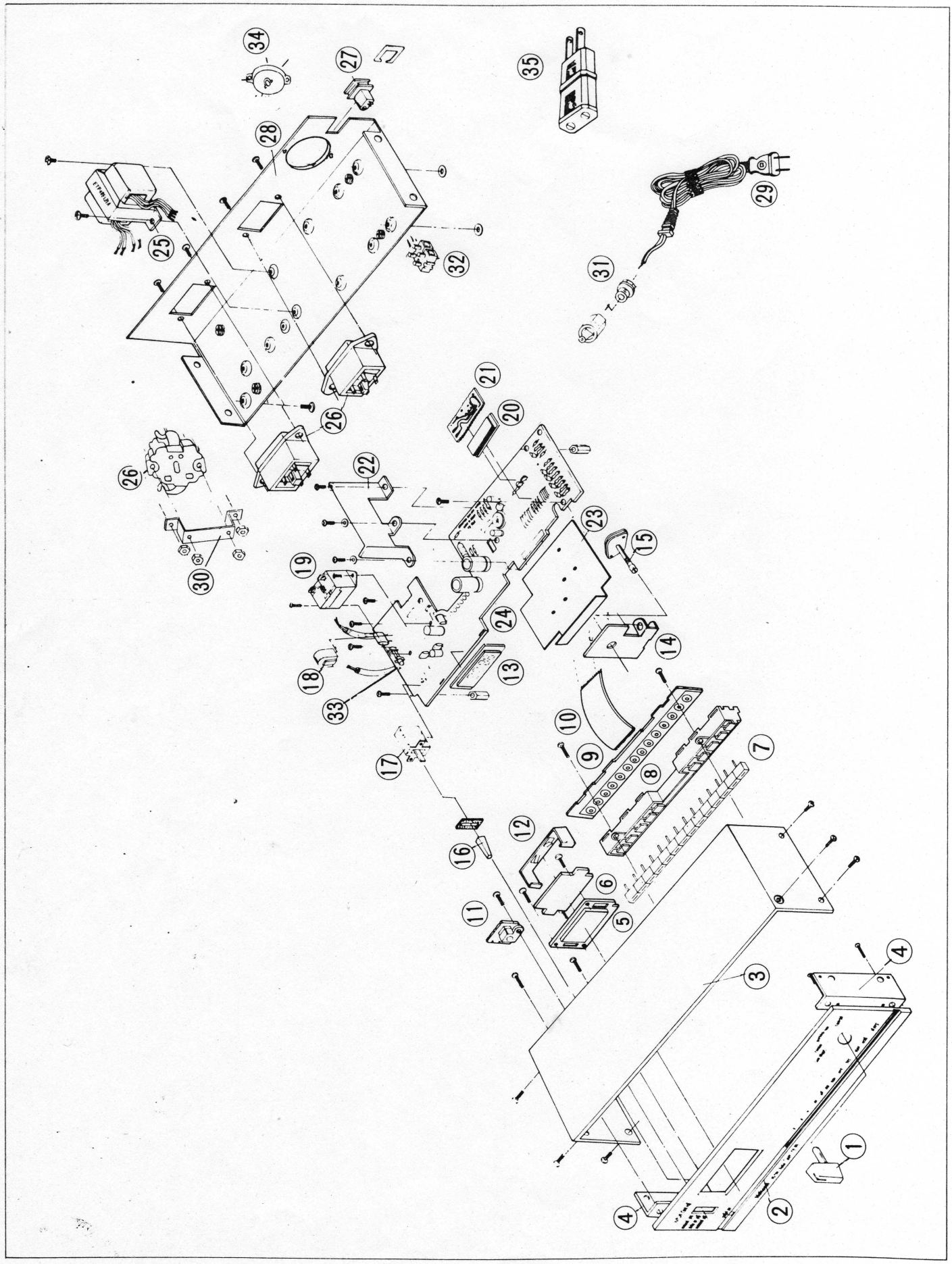
National

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

TROUBLESHOOTING CHECKLIST

Symptom		Cause	Repair method	Check point
Time indication related	No light at all	Blown fuse	Replace fuse	1. Check for wiring short
		Open power cord	Replace power cord	2. Check for open power cord
		Display tube broken, missing	Replace display tube or printed circuit block B	3. Check for damage to display tube
		Open circuited transformer	Replace transformer	4. Check primary & secondary
	Some segments not lit	Open circuit pattern	Repair pattern	1. Check for open circuit
		Improper soldering of LSI display tube leads	Repair soldering	2. Check soldering
		Defective LSI	Replace LSI or printed circuit block B	3. Check LSI output
		Defective indicator tube	Replace display tube or printed circuit block B	4. Check LSI output
	Unnecessary segments light, light leaks	Display tube electrodes touching	Replace display tube or printed circuit block B	1. Check for electrodes touching
		Defective LSI	Replace LSI or printed circuit block B	2. Check circuit, LSI output
	Segments dim	Defective display tube	Replace display tube or printed circuit block B	1. Check LSI output
		Defective LSI	Replace LSI or printed circuit block B	2. Check LSI output
	Segments blink	Defective display tube	Replace display tube or printed circuit block B	1. Check contacts on display tube prongs
		Defective LSI	Replace LSI or printed circuit block B	2. Check stability of segment output
	All segments light	Defective LSI	Replace LSI or printed circuit block B	1. Check output of each segment when all light continuously
	Second indicator does not light	Defective LSI	Replace LSI or printed circuit block B	1. Check output of pin 8 of LSI
	Second indicator lights under normal condition	Defective LSI	Replace LSI or printed circuit block B	1. Check output of pin 8 of LSI
Clock related	Large time error	Defective frequency divider circuit	Replace printed circuit block B	1. Check collector output of transistor T2
		D6, D7, D8 diodes defective	Replace printed circuit block B	2. Check oscillator & frequency divider supply voltage
		Defective soldering of C19, C20	Repair soldering	3. Check soldering
	Clock does not operate, rapid advance does not operate	Defective frequency divider circuit	Replace printed circuit block B	1. Check collector output of transistor T2
		D6, D7, D8 diodes defective	Replace printed circuit block B	2. Check oscillator & frequency divider supply voltage
		Defective LSI	Replace LSI or printed circuit block B	3. Check collector output of transistor T2
		Defective transistor T2	Replace printed circuit block B	4. Check base input and collector output of transistor T2
Time related	Relay continues to operate at time other than set time	Defective transistor T1	Replace printed circuit block B	1. Using tester check continuity of emitter-collector; defective if continuity exists
		Defective Zener diode ZD3	Replace printed circuit block B	2. Check reverse insulation of Zener diode
		Defective LSI	Replace LSI or printed circuit block B	3. Check output of pin 5 of LSI
	Relay does not operate at set time	Defective transistor T1	Replace printed circuit block B	1. Check base input of T1
		Defective LSI	Replace LSI	2. Check output of pin 5 of LSI
		Defective relay	Replace relay	3. Check coil continuity; if no continuity, coil is defective
		Relay circuit pattern open	Repair pattern	4. Visual check
	When relay is ON, outlet indicator does not light	Defective LED	Replace LED	5. Check LED continuity
Operating switch related	Pushbutton switch in deffective	Jumper lead soldering defective	Repair soldering	1. Visual check
		Defective LSI	Replace LSI or printed circuit block B	2. Check input at pin 18 & 21 of LSI
	When button is pushed, wrong indication shown	Jumper lead soldering short	Repair soldering	1. Visual check
		LSI defective	Replace LSI or printed circuit block B	2. Check input at pin 18 & 21 of LSI

DISMANTLED VIEW

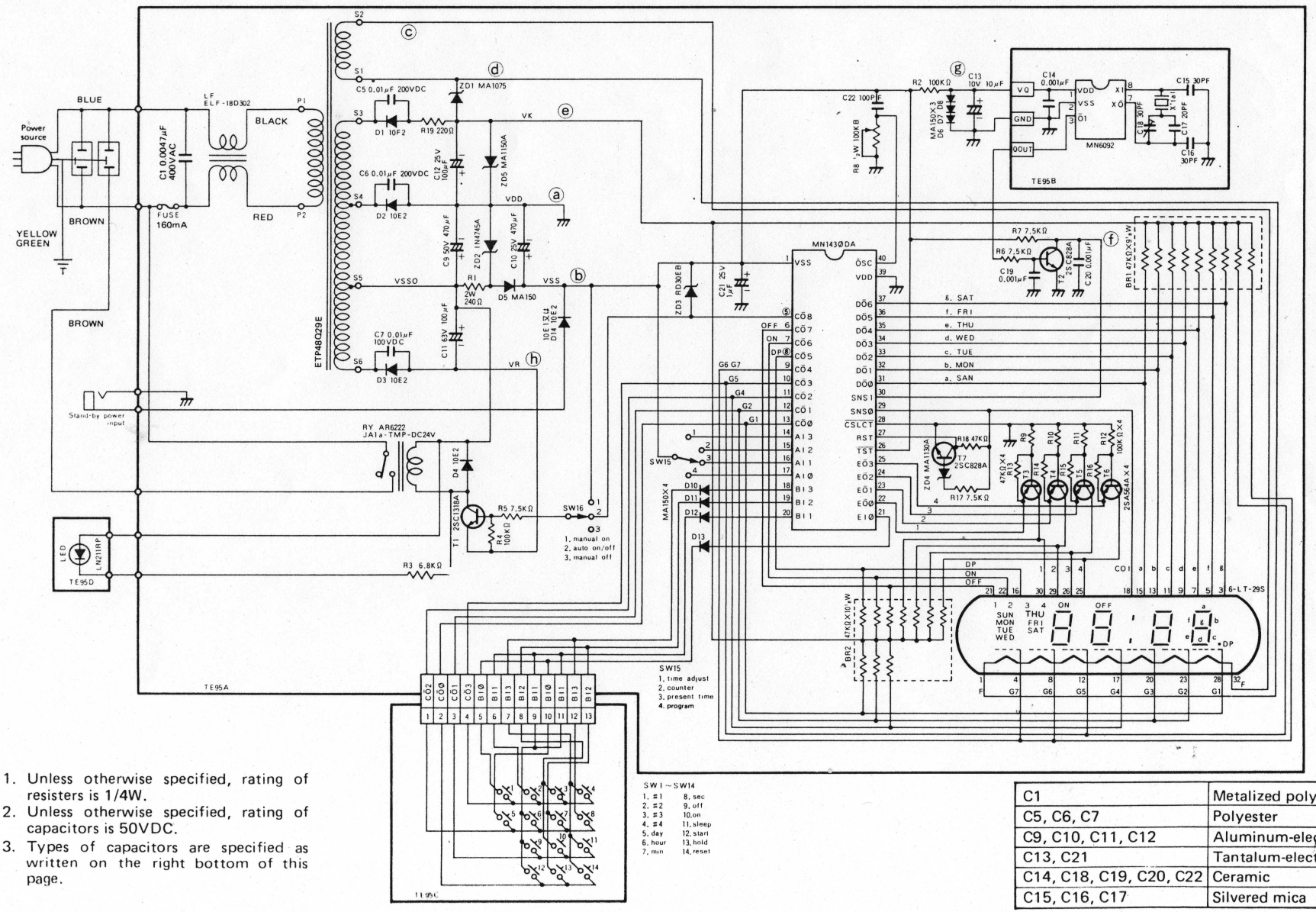


INSPECTION METHOD

Symptom	Test point	Test item	Oscilloscope Digital		Normal voltage/wave form	Interpretation of measurement Fault location
			Probe	Ground		
*No segment light at all	(A)	(A) Filament Voltage	(c)	(d)	2.8 ± 0.2V AC	Filament voltage or VSS show no output *Blown fuse *Open power cord *Defective transformer
		(A) VSS	(b)	(a)	15.2 ± 0.6V DC	
*Some segments do not light *Segments are dim *Segments blink *Unnecessary segments light *Light leakage	(B)	(B) LSI output wave form	(9)-(13)	(e)	When there is no light in segment / When there is segment light GND DC 30V	Segments lit, no LSI output *Defective LSI Segments lit, LSI output exists *Defective display tube
	(B)		(31)-(37)			Segments not lit, LSI has output *LSI defective, soldering short Segments not lit, no LSI output *Defective display tube
*Second blinker does not light *Second blinker lights during normal time	(C)	(C) LSI output wave form	(8)	(e)	When second indicator does not blink / When second indicator blinks GND DC30V	If the output of LSI at pin 8 at 1 Hz does not match the wave form at the left, the LSI is defective
*Large time error *Clock does not operate, rapid advance does not operate	(D)	(D) Oscillator frequency divider supply voltage	(g)	(a)	1.5 ± 0.2V DC	The voltage is not as given at left *D6, D7, D8 diodes defective
		(D) Transistor T2 collector output wave form	(f)	(a)	DC2V VSS VDD 62.5 ms	When wave form is as shown at left *Defective LSI When wave form is not as shown at left *Check clock input signal circuit
*Relay does not operate at set time	(E)	(E) LSI output wave form	(5)	(h)	Relay OFF / Relay ON GND DC7V	When output wave form is not as shown at left *Defective LSI *Defective transistor T1 *Defective Zener diode ZD3

Printed in Japan

CIRCUIT DIAGRAM



Notes:
1. Unless otherwise specified, rating of resisters is 1/4W.
2. Unless otherwise specified, rating of capacitors is 50VDC.
3. Types of capacitors are specified as written on the right bottom of this page.

C1	Metalized polyester
C5, C6, C7	Polyester
C9, C10, C11, C12	Aluminum-electrolytic
C13, C21	Tantalum-electrolytic
C14, C18, C19, C20, C22	Ceramic
C15, C16, C17	Silvered mica

REPLACEMENT PARTS LIST

Ref. No.	Part No.	Part Name & Description	Original Part No.	Per set		
1	TE95003597	Mood selector (black)		1		
	TE95003597I	Mood selector (silver)		1		
2	TE95003067I	Front panel (black)		1		
	TE95002067I	Front panel (silver)		1		
3	TE95003087	Upper case		1		
	TE95003087I	Upper case (England only)		1		
4	TE95000797	Mounting bracket		2		
5	TE95003107	Front cover		1		
6	TE95003068	Front plate		1		
7	TE95003627	Key (black)		14		
	TE95003627I	Key (silver)		14		
8	TE95003687	Key frame		1		
9	TE95002657	Key plate block		1		
10	TE95003457	Block jumper		1		
11	TE95002327	Indicator lamp		1		
12	TE95000217	Display holder		1		
13	TE95002367	Display	6-LT-29S (Futaba)	1		
14	TE95000367	Key bracket		1		
15	TE95002617	Rotary switch	ESRE114K15C (M.E. Comp.)	1		
16	TE95003607	Switch lever (black)		1		
	TE95003607I	Switch lever (silver)		1		
17	TE95002017	Lever switch block	ESL36221 (M.E. Comp.)	1		
18	TE95002717	Line filter		1		
19	TE95005307	Relay (Switherland England only)		1		
	TE90305308	Relay		1		
20	TE95002387	LSI	MN1430DA (M.E. Corp.)	1		
21	TE95002637	Printed circuit B		1		
22	TE95003197	Center panel		1		
23	TE95000147	Mounting panel		1		
24	TE95002627E	Printed circuit A		1		
25	TE95002237D	Power transformer	ETP48Q29E (M.E. Comp.)	1		
26	TE95002507	Receptacle A (A2)		2		
	TE90302507B	Receptacle B (England only)		2		
	TE90302507E	Receptacle C (Denmark only)		1		
	TE90302507F	Receptacle D (C2, w/o earth)		1		
	TE90302507G	Receptacle E (C2, w/earth)		1		
	TE90302507H	Receptacle F (Switherland only)		1		
27	TE95002667	Power plug		1		
28	TE95003097	Lower case A (w/A2 hole)		1		
	TE95003097B	Lower case B (England only)		1		
	TE95003097C	Lower case C (PX only)		1		
	TE95003097E	Lower case D (w/C2 hole)		1		
	TE95003097H	Lower case E (Switherland only)		1		
29	TE95002057	Cord A (A2)		1		
	TE95002057A	Cord B (B2)		1		
	TE95002057B	Cord C (w/o plug) England only		1		
	TE95002057C	Cord D (C2) Flat type		1		
	TE95002057E	Cord E (C2) DEMKO approved		1		
	TE95002057F	Cord F (C2) KEMA approved		1		
	TE95002057G	Cord G (C2) w/earth		1		
	TE95002057H	Cord H (C3) Switherland only		1		
30	TE90300807A	Bracket for receptacle		1		
31	TE95000357A	Bushing		1		
32	TE95003588A	Terminal		1		
33	TE90300317A	Fuse (160mA)	EA160mA (length . . . 20mm)	1		
34	TE90302017A	Voltage conversion switch (PX only)		1		
35	TE90302217A	Adapter sets (PX only)		1		
36	TE95008107I	Instruction book		1		
37	TE95008007A	Individual box		1		